What is Claimed is:

1. A digital BTSC encoder, comprising:

(A) left high pass filter means for receiving a digital left channel audio signal and for digitally high pass filtering said digital left channel audio signal and thereby generating a digital left filtered signal;

(B) right high pass filter means for receiving a digital right channel audio signal and for digitally high pass filtering said digital right channel audio signal and thereby generating a digital right filtered signal;

(C) matrix means for receiving said digital left and digital right filtered signals, and including means for summing said digital left and digital right filtered signals and thereby generating a digital sum signal, and including means for subtracting one of said digital left and digital right filtered signals from the other of said digital left and digital right filtered signals and thereby generating a digital difference signal;

(D) difference channel processing means for digitally processing said digital difference signal;

(E) sum channel processing means for digitally processing said digital sum signal.

2. An encoder according to claim 1, wherein said left and right high pass filter means are characterized by a cutoff frequency that is less than or equal to 50 Hz.

3. An encoder according to claim 2, wherein said left and right high pass filter means are characterized by a passband and a substantially flat response in said passband.

4. A digital BTSC encoder, comprising:

(A) left channel sampling means for receiving an analog left channel audio signal and for sampling said analog left channel audio signal at a sampling frequency substantially equal to N times 15,734 Hz and thereby generating a digital left signal, N being an integer greater than or equal to three;

(B) right channel sampling means for receiving an analog right channel audio signal and for sampling said analog right channel audio signal at a sampling frequency substantially equal to N times 15,734 Hz and thereby generating a digital right signal;

(C) matrix means for receiving said digital left and digital right signals, and including means for summing said digital left and digital right signals and thereby generating a digital sum signal, and including means for subtracting one of said digital left and digital right signals from the other of said digital left and digital right signals and thereby generating a digital difference signal;

(D) difference channel processing means for digitally processing said digital difference signal;

(E) sum channel processing means for digitally processing said digital sum signal.

5. An encoder according to claim 3, further including digital high pass filter means for high pass filtering said digital left and right signals.

6. A digital BTSC encoder, comprising:

(A) matrix means for receiving a digital left channel audio signal and a digital right channel audio signal, and including means for summing said digital left and right channel audio signals and thereby generating a digital sum signal, and including means for subtracting one of said digital left and right channel audio signals from the other of said digital left and right channel audio signals and thereby generating a digital difference signal;

(B) difference channel processing means for digitally processing said digital difference signal, said digital processing introducing a first phase error to said digital difference signal;

(C) sum channel processing means for processing said digital sum signal and including means for introducing a second phase error to said digital sum signal and thereby compensating for said first phase error introduced into said digital difference signal.

7. An adaptive digital signal weighing system: including a signal path for transmitting an electrical information signal of a predetermined bandwidth through said system, said system further comprising:

digital filter means disposed in said signal path for varying the gain impressed on the portion of said information signal within a first select spectral region within said predetermined bandwidth by a first variable gain factor, said first variable gain factor varying in response to and as a function of a first control signal;

means for digitally generating said first control signal only in response to and in accordance with the signal energy of said information signal within a second select spectral region including at least a part of said first select spectral region;

digital gain control means disposed in said signal path and coupled to said digital filter means for varying the signal gain impressed on said information signal substantially throughout said predetermined bandwidth by a second variable gain factor, said second variable gain factor varying in response to and as a function of a second control signal; and

means for digitally generating said second control signal in response to and as a function of the signal energy of said information signal substantially within a third select spectral region within said predetermined bandwidth.

8. A digital system for encoding an electrical information signal of a predetermined bandwidth so that said information signal can be recorded on or transmitted through a dynamically-limited, frequency dependent channel having a narrower dynamically-limited portion in a first spectral region than in at least one other spectral region of said predetermined bandwidth, said system comprising:

input means for receiving said information signal;

a signal transmission path coupled to said input means for transmitting said information signal received at said input means;

output means coupled to said input means through said signal transmission path for providing said information signal as encoded by said system;

digital gain control means coupled to said signal path for varying the signal gain impressed on said information signal substantially throughout said predetermined bandwidth, said signal gain varying in response to and as a function of a first control signal;

digital filter means coupled to said signal path and said digital gain control means for impressing a second variable gain on the portion of said information signal substantially within said first spectral region so as to preemphasize said portion with respect to the remaining portions of said information signal, said second variable gain varying in response to and as a function of a second control signal;

means for digitally generating said first control signal in response to and as a function of the signal energy of said information signal substantially within a second spectral region of said predetermined bandwidth; and

means for digitally generating said second control signal only in response to and in accordance with the signal energy of said information signal within a third spectral region of said predetermined bandwidth including at least a part of said first spectral region.

9. An adaptive digital signal weighing system, comprising:

a signal path for transmitting an electrical information signal of a predetermined bandwidth through said system;

variable coefficient digital filter means for filtering said information signal, said filtering being characterized by a variable coefficient transfer function and said filtering varying the gain impressed on the portion of said information signal within a first select spectral region within said predetermined bandwidth by a first variable gain factor, the variable coefficients of said variable coefficient transfer function and said first variable gain factor varying in response to and as a function of a first control signal;

means for digitally generating said first control signal only in response to and in accordance with the signal energy of said information signal within a second select spectral region including at least a part of said first select spectral region;

digital gain control means disposed in said signal path and coupled to said variable coefficient digital filter means for varying the signal gain impressed on said information signal substantially throughout said predetermined bandwidth by a second variable gain factor, said second variable gain factor varying in response to and as a function of a second control signal; and

means for digitally generating said second control signal in response to and as a function of the signal energy of said information signal substantially within a third select spectral region within said predetermined bandwidth.

10. A digital BTSC encoder according to claim 1, wherein said sum channel processing means and said difference channel processing means are both implemented on a single integrated circuit.

11. A digital BTSC encoder according to claim 1, wherein said digital left and right channel audio signals are digitally sampled signals sampled with a sampling frequency substantially equal to N times 15,734 Hz, N being an integer greater than or equal to three.

12. A digital BTSC encoder according to claim 1, wherein said difference channel processing means includes:

(A) difference input means for receiving said digital difference signal;

(B) difference output means for providing an encoded difference signal;

(C) a difference signal transmission path coupled to said difference input means and to said difference output means, and including means for generating said encoded difference signal from said digital difference signal.

13. A digital BTSC encoder according to claim 12, wherein said difference channel processing means includes spectral compression means for receiving a spectral compression input signal from said difference signal transmission path and for compressing said spectral compression input signal according to a function of an energy level of said encoded difference signal and thereby generating a spectral compression output signal, and including means for applying said spectral compression output signal to said difference signal transmission path.

14. A digital BTSC encoder according to claim 13, wherein said spectral compression means includes means for measuring a first energy level of said encoded difference signal in a first select spectral portion, and for generating a first control signal representative of said first energy level.

15. A digital BTSC encoder according to claim 14, wherein said spectral compression means includes a variable emphasis filter for receiving and digitally filtering said spectral compression input signal and thereby generating said spectral compression output signal, the filtering provided by said variable emphasis filter being characterized by a transfer function including a plurality of coefficients, said spectral compression means further including means for selecting said plurality of coefficients according to a function of said first control signal.

16. A digital BTSC encoder according to claim 15, wherein said means for selecting said plurality of coefficients includes a memory look up table.

17. A digital BTSC encoder according to claim 16, wherein said means for selecting said plurality of coefficients includes logarithmic generator means for receiving and logarithmically compressing said first control signal and thereby generating a logarithmically compressed signal and further includes means for applying said logarithmically compressed signal to said memory look up table.

18. A digital BTSC encoder according to claim 15, wherein said means for selecting said plurality of coefficients includes means for calculating said plurality of coefficients as a function of said first control signal.

19. A digital BTSC encoder according to claim 15, wherein said spectral compression means includes spectral bandpass filter means for receiving and filtering a signal representative of said encoded difference signal and thereby generating a spectral signal, said filtering provided by said spectral bandpass filter means being characterized by a passband in said first select spectral portion.

20. A digital BTSC encoder according to claim 19, wherein said spectral compression means includes first RMS level detector means for receiving said spectral signal and for generating therefrom said first control signal, said first control signal being representative of an RMS value of said spectral signal.

21. A digital BTSC encoder according to claim 19, wherein said spectral compression means includes an amplifying means for receiving and amplifying said encoded difference signal and thereby generating said signal representative of said encoded difference signal.

22. A digital BTSC encoder according to claim 15, wherein said difference channel processing means includes wideband compression means for receiving a wideband compression input signal from said difference signal transmission path and for compressing said wideband compression input signal according to a function of an energy level of said encoded difference signal and thereby generating a wideband compression output signal, and including means for applying said wideband compression output signal to said difference signal transmission path.

23. A digital BTSC encoder according to claim 22, wherein said spectral compression input signal comprises said wideband compression output signal.

24. A digital BTSC encoder according to claim 22, wherein said wideband compression means includes means for measuring a second energy level of said encoded difference signal in a second select spectral portion, and for generating a second control signal representative of said second energy level.

25. A digital BTSC encoder according to claim 24, wherein said wideband compression means includes amplifier means for receiving and amplifying said wideband compression input signal using a gain controlled by said second control signal and thereby generating said wideband compression output signal.

26. A digital BTSC encoder according to claim 25, wherein said wideband compression means includes wideband bandpass filter means for receiving and filtering a signal representative of said encoded difference signal and thereby generating a wideband signal, said filtering provided by said wideband bandpass filter means being characterized by a passband in said second select spectral portion.

27. A digital BTSC encoder according to claim 26, wherein said wideband compression means includes second RMS level detector means for receiving said wideband signal and for generating therefrom said second control signal, said second control signal being representative of an RMS value of said wideband signal.

28. A digital BTSC encoder according to claim 22, wherein said difference channel processing means includes first low pass filter means for receiving a first low pass filter input signal from said difference signal transmission path and including means for low pass filtering said first low pass filter input signal and thereby generating a first low pass filter output signal, and including means for applying said first low pass filter output signal to said difference signal transmission path.

29. A digital BTSC encoder according to claim 28, wherein said difference channel processing means includes second low pass filter means for receiving a second low pass filter input signal from said difference signal transmission path and including means for low pass filtering said second low pass filter input signal and thereby generating a

second low pass filter output signal, and including means for applying said second low pass filter output signal to said difference signal transmission path.

30. A digital BTSC encoder according to claim 29, wherein said sum channel processing means includes:

(A) sum input means for receiving said digital sum signal;

(B) sum output means for providing a conditioned sum signal;

(C) a sum signal transmission path coupled to said sum input means and to said sum output means, and including means for generating said conditioned sum signal from said digital sum signal.

31. A digital BTSC encoder according to claim 30, wherein said sum channel processing means includes sum channel low pass filter means for receiving a sum channel low pass filter input signal from said sum signal transmission path and including means for low pass filtering said sum channel low pass filter input signal and thereby generating a sum channel low pass filter output signal, and including means for applying said sum channel low pass filter output signal to said sum signal transmission path.

32. A digital BTSC encoder according to claim 31, wherein the filtering provided by a cascade of said first and second low pass filter means is substantially similar to the filtering provided by said sum channel low pass filtering means.

33. A digital BTSC encoder according to claim 32, wherein the filtering provided by said sum channel low pass filtering means is characterized by a null at 15,734 Hz.

34. A digital BTSC encoder according to claim 33, wherein the filtering provided by said sum channel low pass filtering means is characterized by a pass band between zero and 15 kHz

35. A digital BTSC encoder according to claim 34, wherein the filtering provided by said sum channel low pass filtering means is characterized by a cutoff above 15 kHz.

36. A digital BTSC encoder according to claim 31, wherein said difference channel processing means includes first fixed preemphasis filter means for receiving a first preemphasis input signal from said difference signal transmission path and including means for filtering said first preemphasis input signal and thereby generating a first preemphasis output signal, and including means for applying said first preemphasis output signal to said difference signal transmission path.

37. A digital BTSC encoder according to claim 36, wherein said difference channel processing means includes second fixed preemphasis filter means for receiving a second preemphasis input signal from said difference signal transmission path and including means for filtering said second preemphasis input signal and thereby generating a second preemphasis output signal, and including means for applying said second preemphasis output signal to said difference signal transmission path.

38. A digital BTSC encoder according to claim 37, wherein said sum channel processing means includes 75 μs preemphasis filter means for receiving a 75 μs preemphasis input signal from said sum signal transmission path and including means for filtering said 75 μs preemphasis input signal and thereby generating a 75 μs preemphasis output signal, and including means for applying said 75 μs preemphasis output signal to said sum signal transmission path.

39. A digital BTSC encoder according to claim 38, wherein said sum channel processing means includes static equalization filter means for receiving a static equalization input signal from said sum signal transmission path and including means for filtering said static equalization input signal and thereby generating a static equalization output signal, and including means for applying said static equalization output signal to said sum signal transmission path.

40. A digital BTSC encoder according to claim 39, wherein the filtering provided by said second preemphasis filter means is characterized by a second preemphasis phase response, the filtering provided by said 75 μs preemphasis filter means being characterized by a 75 μs preemphasis phase response, a difference between said second preemphasis phase response and a first reference phase response being substantially similar to a difference between said 75 μs preemphasis phase response and a second reference phase response.

41. A digital BTSC encoder according to claim 40, wherein the filtering provided by said first preemphasis filter means is characterized by a first preemphasis phase response, the filtering provided by said static equalization filter means being characterized by a static equalization phase response, said first preemphasis phase response being substantially similar to said static equalization phase response.

42. A digital BTSC encoder according to claim 41, wherein said first preemphasis input signal comprises said first low pass filter output signal.

43. A digital BTSC encoder according to claim 42, wherein said wideband compression input signal comprises said first preemphasis output signal.

44. A digital BTSC encoder according to claim 43, wherein said second preemphasis input signal comprises said spectral compression output signal.

45. A digital BTSC encoder according to claim 41, wherein said difference channel processing means includes difference dynamic equalization filter means for receiving a difference dynamic equalization input signal from said difference signal transmission path and including means for filtering said difference dynamic equalization input signal and thereby generating a difference dynamic equalization output signal, and including means for applying said difference dynamic equalization output signal to said difference signal transmission path.

46. A digital BTSC encoder according to claim 45, wherein said sum channel processing means includes sum dynamic equalization filter means for receiving a sum dynamic equalization input signal from said sum signal transmission path and including means for filtering said sum dynamic equalization input signal and thereby generating a sum dynamic equalization output signal, and including means for applying said sum dynamic equalization output signal to said sum signal transmission path.

47. A digital BTSC encoder according to claim 46, wherein the filtering provided by said difference dynamic equalization filter means is characterized by a difference dynamic equalization phase response, the filtering provided by said variable emphasis filter being characterized by a variable emphasis phase response, the filtering provided by said sum dynamic equalization filter means being characterized by a sum dynamic equalization phase response, said difference dynamic equalization, variable emphasis, and sum dynamic equalization phase responses all varying according to a function of said second control signal.

48. A digital BTSC encoder according to claim 30, further including composite modulator means for receiving said encoded difference signal and said conditioned sum signal and for generating therefrom a composite modulated signal.